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(21) International Application Number: PCT/US94/10175 (22) International Filing Date: 7 September 1994 (07.09.94) (30) Priority Data: 08/116,908 7 September 1993 (07.09.93) US (71) Applicant: ESCALON OPHTHALMICS, INC. [US/US]; 182 Tamarack Circle, Skillman, NJ 08558 (US). (72) Inventor: BENEDETTO, Dominick, A.; 124 Avenue B, Bayonne, NJ 07002 (US). (74) Agent: SAUNDERS, Thomas, M.; Lorusso & Lord, 440 Commercial Street, Boston, MA 02109 (US).		(81) Designated States: CA, JP, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>
(54) Title: SURFACE ACTIVE VISCOELASTIC SOLUTIONS FOR OCULAR USE (57) Abstract <p>This invention encompasses a modified mucopolysaccharide solution for use as a biologically active therapeutic infusion comprising a pharmaceutical grade viscoelastic fraction selected from a group consisting of an acyl-substituted hyaluronic acid having acyl groups thereof with three to twenty carbon atoms and mixtures of said acyl-substituted hyaluronic acid with hyaluronic acid, and hydroxypropylmethylcellulose. In particular these solutions have a surface tension of between 40 and 65 dynes/cm²; particularly a viscoelastic fraction has an average molecular weight of at least 50,000. In some embodiments a physiological buffer fraction is present. This invention further encompasses a method of using the claimed composition.</p>		

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SURFACE ACTIVE VISCOELASTIC SOLUTIONS FOR OCULAR USE

This application is a continuation-in-part of copending U.S. Pat. App. 08/061,773 filed May 13, 1993, which is a continuation of U.S. Pat. App. 07/440,078 filed November 22, 1989, now abandoned.

Field of the Invention.

The present invention relates to ophthalmic solutions for use during ocular and intraocular surgery, and more particularly to the use of surface active viscoelastic solutions during the extraction of a cataractous human lens and the implantation of a prosthetic ocular and intraocular lens. During surgery, the use of ophthalmic infusions with controlled physical properties, especially surface activity and viscoelastic properties, is advantageous for (1) replacing the fluid aqueous humor or ocular and intraocular air, (2) protecting the internal structures of the eye from accidental instrument or ocular and intraocular prosthetic device contact, (3) preventing irrigation damage by solutions used in routine cataract surgery, and (4) retarding aspiration from the eye of the viscoelastic solution during the surgical procedure. In addition, the invention relates to a method of adhering a contact lens to the surface of the eye, such as in association with procedures permitting a medical professional to view ocular and intraocular structures through the contact lens and through the viscoelastic solution. In

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1 another application, the viscoelastic solution of this invention
2 is used by injecting the solution into or under tissues within
3 the eye, such as to dissect tissue off of the retina.

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Background of the Invention

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In the past, biocompatible polymers used in ocular and
intraocular surgery have been the naturally occurring
mucopolysaccharides hyaluronic acid and chondroitin sulfate;
mixtures of hyaluronic acid and chondroitin sulfate; and,